

Claims

What is claimed is:

1. A nozzle for use in conjunction with a fuel dispenser, said nozzle comprising:
  - a boot adapted to form a seal when placed against a vehicle; and
  - a check valve positioned in said boot, said check valve normally closed and adapted to open in the presence of a negative pressure.
2. The nozzle of claim 1 wherein said boot is a full-sized boot.
3. The nozzle of claim 1 wherein said boot is a mini-boot.
4. The nozzle of claim 1 wherein said seal is a hard seal.
5. The nozzle of claim 1 wherein said seal is a soft seal.
6. The nozzle of claim 1 wherein said check valve allows air to pass into said boot when said check valve is open.
7. The nozzle of claim 6 wherein said air offsets the negative pressure and prevents a nuisance shut-off during a fueling transaction.
8. A method of capturing fuel vapors during a fueling transaction, comprising:
  - placing a boot around a nozzle;
  - forming a seal with the boot when the boot is placed against a vehicle;and
  - selectively opening a check valve positioned in the boot.
9. The method of claim 8 wherein placing a boot around a nozzle comprises placing a full-sized boot around a nozzle.
10. The method of claim 8 wherein placing a boot around a nozzle comprises placing a mini-boot around a nozzle.

11. The method of claim 8 wherein forming a seal comprises forming a hard seal.
12. The method of claim 8 wherein forming a seal comprises forming a soft seal.
13. The method of claim 8 wherein selectively opening a check valve positioned in the boot comprises opening the check valve to admit air into the boot to offset a negative pressure.
14. A fuel dispenser comprising:
  - a vapor recovery system, comprising:
    - a hose;
    - a nozzle comprising a boot, said nozzle connected to said hose;
  - and
  - a check valve adapted to let air into said vapor recovery system selectively if a negative pressure is exerted on said nozzle.
15. The fuel dispenser of claim 14 wherein said vapor recovery system is a balance vapor recovery system.
16. The fuel dispenser of claim 14 wherein said vapor recovery system further comprises a pump to draw vapors into said vapor recovery system.
17. The fuel dispenser of claim 16 wherein said pump is a constant speed pump.
18. The fuel dispenser of claim 16 wherein said pump is a variable speed pump.
19. The fuel dispenser of claim 14 wherein said boot is a mini-boot.
20. The fuel dispenser of claim 14 wherein said boot is a full-sized boot.

21. The fuel dispenser of claim 14 wherein said check valve is positioned in said boot.
22. The fuel dispenser of claim 14 wherein said check valve is positioned in said hose.
23. The fuel dispenser of claim 14 wherein said check valve is positioned in said nozzle.
24. The fuel dispenser of claim 14 further comprising a controller adapted to control functions of the fuel dispenser including the vapor recovery system.
25. The fuel dispenser of claim 24 further comprising a pressure sensor, said pressure sensor associated with said vapor recovery system and reporting pressure readings to said controller.
26. The fuel dispenser of claim 25 wherein said controller is adapted to determine if a vehicle being fueled is equipped with an onboard vapor recovery system based on pressure readings from said pressure sensor.
27. The fuel dispenser of claim 26 wherein said controller is adapted to turn off said vapor recovery system if the vehicle is equipped with an onboard vapor recovery system.
28. The fuel dispenser of claim 26 wherein said controller is adapted to turn on said vapor recovery system if the vehicle is not equipped with an onboard vapor recovery system.
29. The fuel dispenser of claim 25 wherein said pressure readings are provided at a time corresponding to a beginning of a fueling transaction.
30. The fuel dispenser of claim 25 wherein said pressure readings are provided at a time after commencement of a fueling transaction.

31. A method of collecting fuel vapors during a fueling transaction, comprising:
  - selectively opening a check valve in a vapor return path if a negative pressure is applied to the vapor return path; and
  - if said check valve is open, allowing air into said vapor return path.
32. The method of claim 31 wherein selectively opening a check valve comprises opening a check valve in a boot.
33. The method of claim 31 wherein selectively opening a check valve comprises opening a check valve in a nozzle.
34. The method of claim 31 wherein selectively opening a check valve comprises opening a check valve in a hose.
35. The method of claim 31 further comprising forming a seal with a boot against a vehicle.
36. The method of claim 35 wherein forming a seal with a boot comprises forming a seal with a mini-boot.
37. The method of claim 35 wherein forming a seal with a boot comprises forming a seal with a full-size boot.
38. The method of claim 31 further comprising sensing a pressure in the vapor return path.
39. The method of claim 38 further comprising reporting a sensed pressure to a controller.
40. The method of claim 39 further comprising modifying vapor collection in response to the sensed pressure.

41. The method of claim 40 wherein modifying vapor collection comprises turning on a normally off vapor recovery system.

42. The method of claim 40 wherein modifying vapor collection comprises turning off a normally on vapor recovery system.

43. The method of claim 40 wherein modifying vapor collection comprises slowing down vapor recovery in a vapor recovery system.

44. A method of preventing competition between a fuel dispenser's vapor recovery system and an ORVR system, comprising:

in the presence of a negative pressure in a vapor return line, mechanically closing the vapor return line such that a vapor recovery system pump is isolated from a fuel dispenser nozzle.